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The small pelagic fisheries in the South-Mediterranean Region (Western Mediterranean Sea): Past and present state

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Abstract

A review on small pelagic fisheries of anchovy (*Engraulis encrasicolus*) and sardine (*Sardina pilchardus*) in the Northern Alboran Sea (Western Mediterranean Sea) was carried out. The study was focused on a very extensive historical serie of landings (from 40's to the present), as well as the number of fishery vessels and fishery effort during the last decade, and the assessment in 2001.

Introduction

The geographical area named as South Mediterranean Region (SMR) correspond to the division previously referenced as 37.1.5 by CGPM. FAO; it is limited by the Strait of Gibraltar at the west, and the Gata Cape in the east (Fig. 1). At the present, it is included in the management unit Northern Alborán Sea. The harbours of Ceuta and Melilla (Northern Africa) are also included in the SMR (Fig. 1).

Sardine (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*) are the main target species of the purse seine fleet in the SMR, but other species with lower economical importance are also captured, sometimes representing a high percentage of the capture: horse mackerel (*Trachurus* spp.), mackerel (*Scomber* spp.), frigate mackerel (*Auxis rochei*), Atlantic saury (*Scomberesox saurus*) and gilt sardine (*Sardinella aurita*). This report is exclusively focused on fishery of anchovy and sardine.



Fig. 1. Geographical area of the South-Mediterranean Region. Main harbours are shown.

Historical series of catches

Historical series of catches (from 1945 to 2001) were obtained from the files of the “Secretaría General de Pesca” (from 1945 to 1986) and “Fondo de Regulación y Ordenación de Mercado” and “Instituto Español de Oceanografía” (from 1987 to 2001).

Sardine. From 1945 to 1956, a high percentage of catches were made in Northern Africa, but the independence of Morocco in 1956, as well as the loss of interest on this species by the vessels from the harbour of Melilla, originated that catches in Northern Africa decreased to undetectable amounts from 1985 onwards (Fig. 2). On the other hand, an up-an-down pattern was observed in the Northern Alborán Sea from 1956 to the present.

Before 60’s, sardine was the species with the highest economical value, but the price of anchovy and sardine were balanced in 1962. Then, the value of the anchovy followed going up, originating that the purse seine fleet focused on this species rather than sardine from mid 60’s onwards.

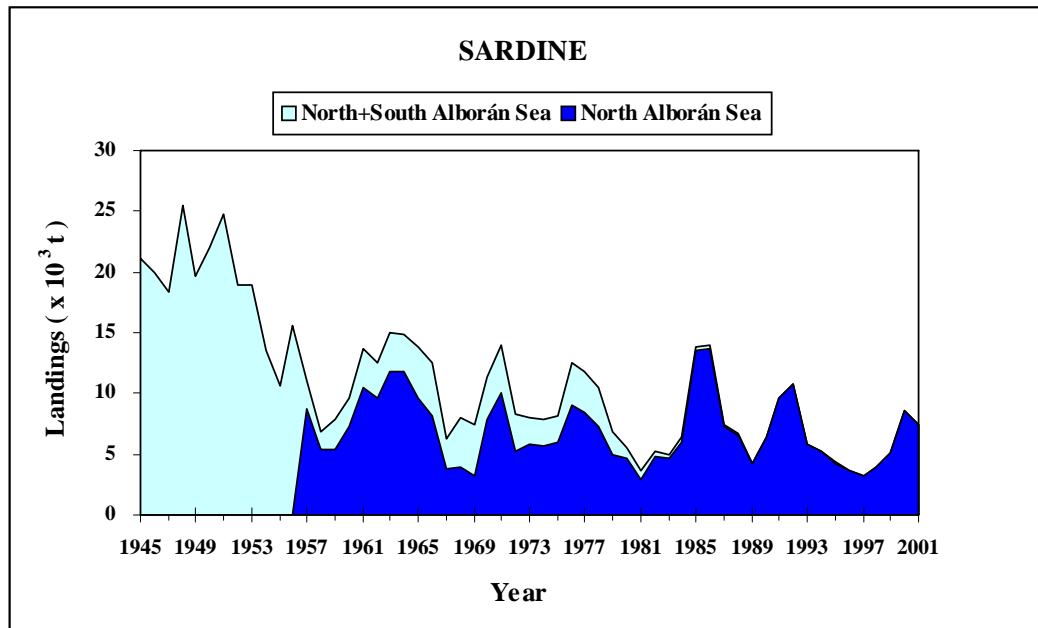


Fig. 2. Landings of sardine in the South-Mediterranean Region (1945-2001).

Anchovy. It was impossible to discriminate the catches of anchovy from Southern and Northern Alboran Sea before 1978. The economical value of anchovy was low during 40's and 50's, but it was caught by fishery vessels from Ceuta and Melilla, as well as from harbours from Northern area. From the end of the 70's to 1984, a very important catch area was located in Southern Alboran Sea, where Spanish vessels worked in the framework of an International Fishing Agreement with the Kingdom of Morocco. Twenty eight thousands metric tonnes of anchovy were landed in 1982 in the Spanish harbours from SMR (Fig. 3), corresponding a 87% to the catches from Southern area, and a 13% from the Northern one (Giráldez & Abad, 1991).

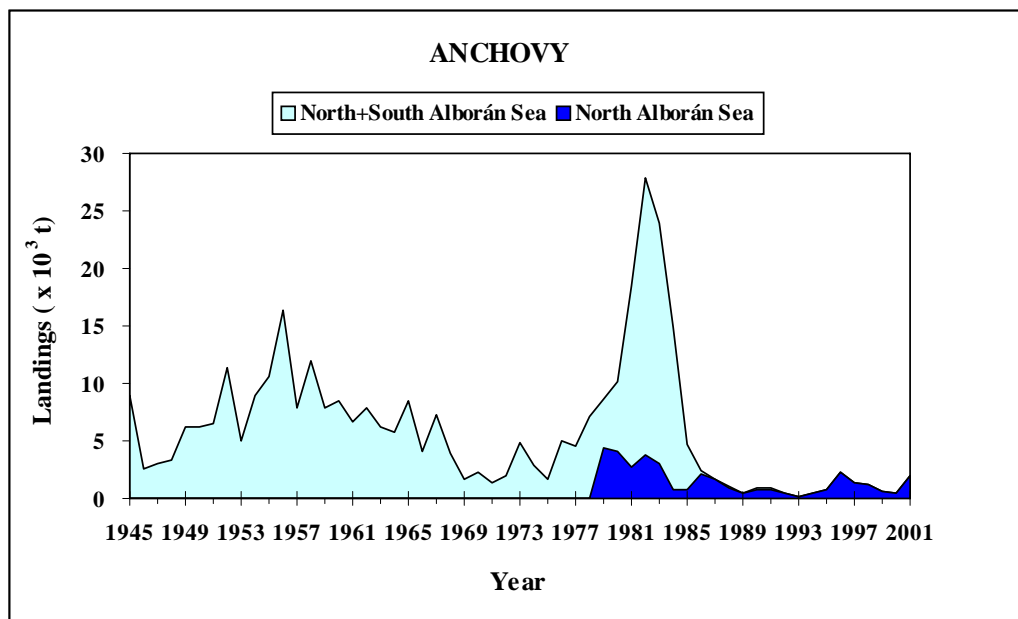


Fig. 3. Landings of anchovy in the South-Mediterranean Region (1945-2001).

Landings in the Northern area reached a minimum of 157 metric tonnes in 1993; moreover, an unsuccessful recruitment occurred in this year, possibly linked to a demographic bloom of *Capros aper* in the Alboran Sea (Abad & Giráldez, 1990).

Purse seine fleet

The purse seine fleet from the SMR continuously decreased in the last two decades, from more than 230 vessels in 1980 to 120 in 2001 (Fig. 4). The present fleet is characterised by low levels of GRT: 93% of the vessels are lower than 40 GRT, with an overall mean of 17.2 GRT. A strong reduction of larger vessels occurred from 1985 onwards, possibly linked to the decrease in anchovy catches in Northern Morocco (Fig. 5). At the present, only few vessels with a high GRT are working; typically, they move to the Spanish Levante area (from Adra and Almería).

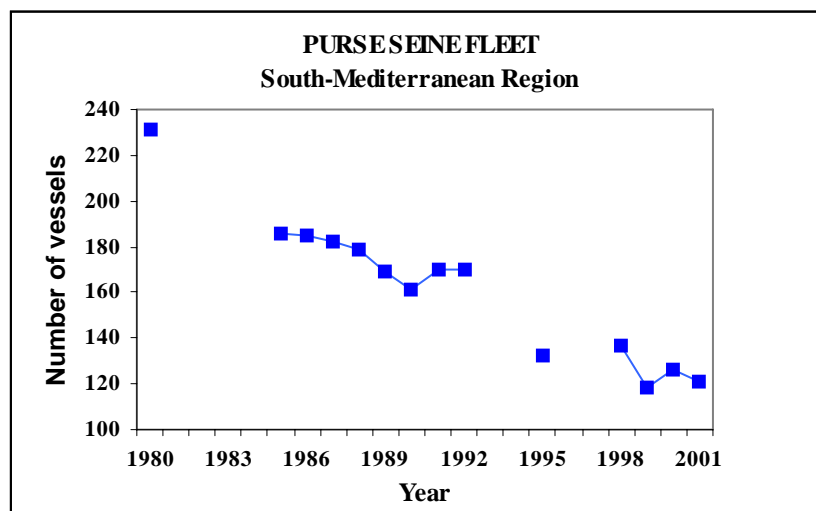


Fig. 4. Evolution the number of vessels in the South–Mediterranean Region

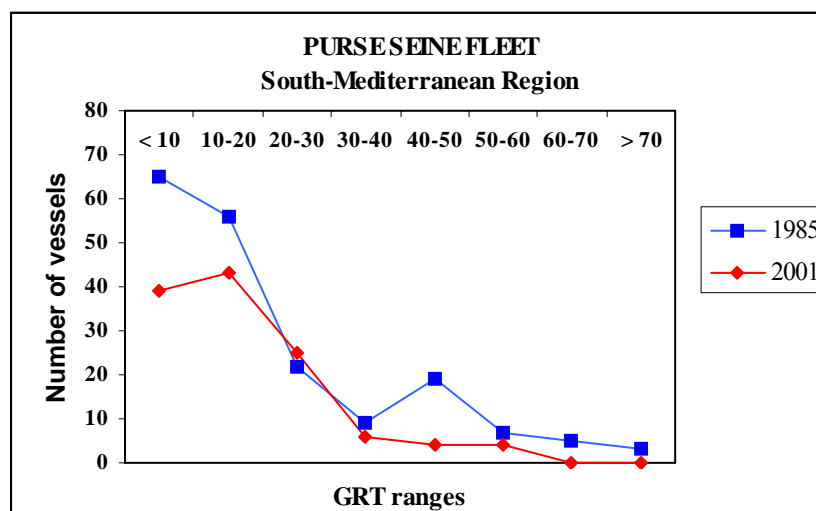


Fig. 5. Evolution of the GRT ranges in 1985 and 2001 in the South–Mediterranean Region

Fishery time period

The principal fishery time periods of sardine and anchovy are summer-autumn and autumn, respectively.

Fishing area

At the present, the sardine is caught in all the areas, but its economical importance is low. Anchovy is the most important species on the basis of its high economical value; it is caught in the Málaga Bay principally (Fig. 6). Fleets from all the harbours in SMR concentrate in Málaga Bay during the years of high catches of anchovy, but they land in the harbour of Málaga (Abad & Giráldez, 1990,1997; Giráldez & Abad, 1991) because the landings are carried out in the closer harbours to the catch areas.

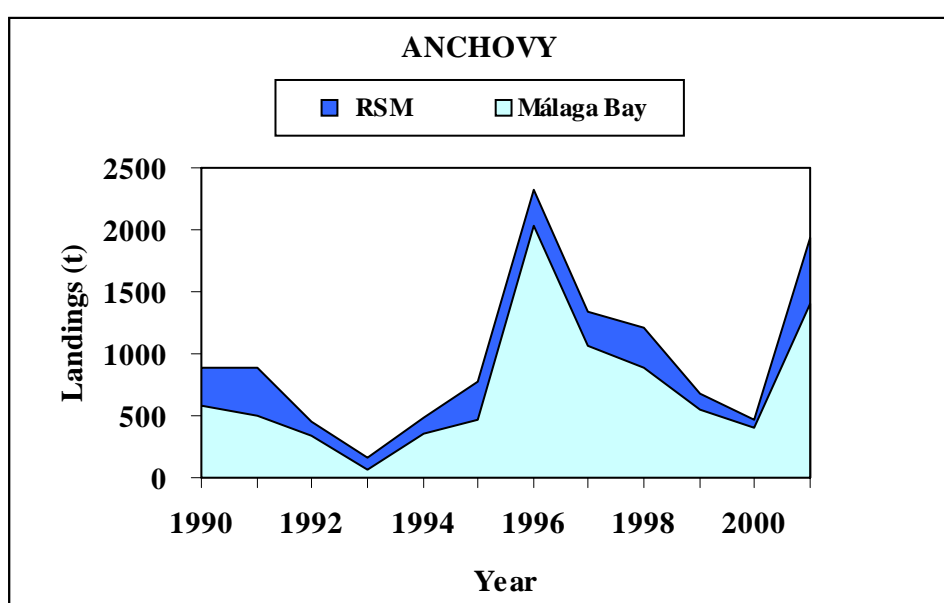


Fig. 6. Catches of anchovy in the SMR and Málaga Bay from 1990 to 2001.

Catches and fishery effort

The selected effort unit was the effective night fishing. The historical series of catches and efforts for sardine correspond to the data from the most important harbours (Málaga, Adra and Almería) while the data from the Málaga harbour was used for the anchovy.

Sardine. A peak of landings was found in 1991-1992, but they decreased to an overall mean value of 1000-2000 metric tonnes during 1994-1998; then, landings recovered during last four years (Fig. 7). Moreover, the CPUE values reached a peak in the last years, suggesting an increasement in efficiency of the fishery effort.

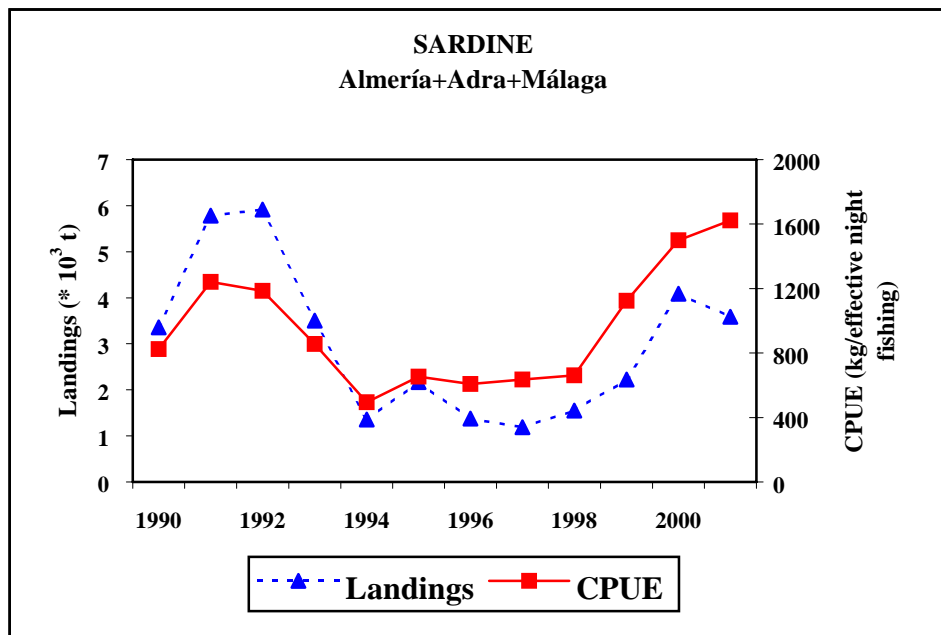


Fig. 7. Yearly evolution of catches of sardine and CPUE, for three main harbours of the South-Mediterranean Region.

Anchovy. It must be emphasised that the fishery of anchovy in the Malaga Bay is exclusively focused on individuals from early age classes because older age classes are not found: almost all the catch correspond to class 0, and few individuals from class 1 are also caught. Individuals from class ≥ 2 were only found in one of the years during the study period, and they were lower than 1% of the total. Therefore, high levels of catches usually correlate with successful and high recruitment periods, while unsuccessful recruitments in a given year correlate with low levels of catches.

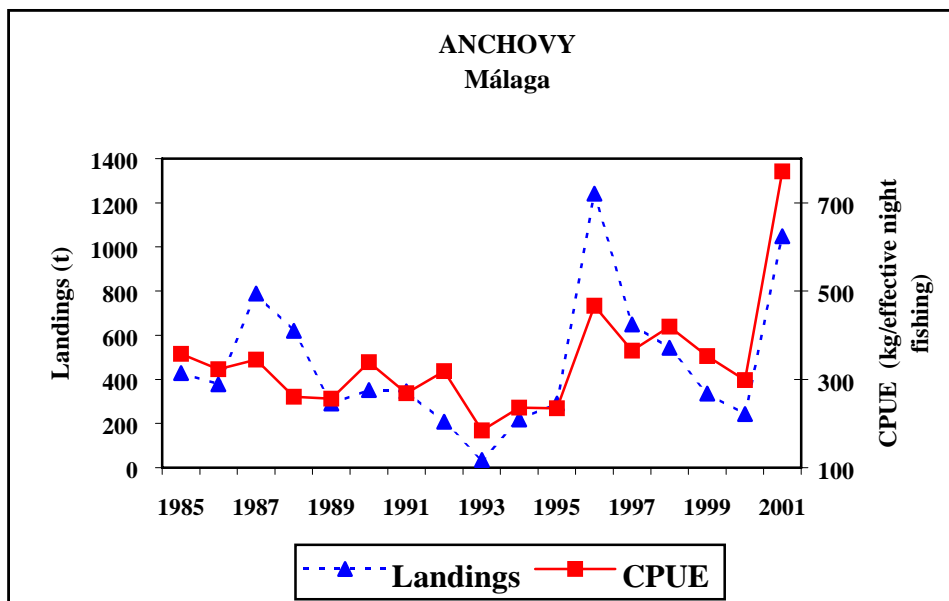


Fig. 8. Yearly evolution of catches of anchovy and CPUE in the Málaga Bay.

The catches of anchovy in the Málaga Bay were 85% of the total from the SMR. The catches of anchovy dramatically decreased from 1987 to 1993 (when 35 metric tonnes were landed), but then recovered in 1996. A new diminution of landings occurred in the following years, reaching a minimum in 2000. Finally, a strong increment of landings was recorded in 2001 (Fig. 8). The values of CPUE reached the highest level in 2001 (Fig. 8).

At the present, the Málaga Bay is the only one place with a catch area in the north of the Alboran Sea.

Acoustic Assessment

There are not autumn recent evaluations for the whole area in SMR, but some partial evaluations are available.

During the acoustic survey ECOMED 2001, the abundance of sardine and anchovy in the Málaga Bay were estimated. The estimation of anchovy biomass in Málaga Bay in 2001 was 13 210 metric tonnes, with an abundance estimation of 3896 millions of individuals (corresponding 93 % of total to recruits). Due to the bad weather, it was impossible to cover the whole area of the SMR. However, because anchovy concentrates in Málaga Bay, the evaluation could be considered as a good estimation of biomass of this species in the Northern Alboran Sea for 2001. The estimation of sardine biomass was 1723 metric tonnes.

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